CLAIMS

What is Claimed is:

1. A method of sensing and controlling a temperature of a resistive element configured for use in a read/write head of a magnetic data storage device, the method comprising:

detecting a voltage across the resistive element, the voltage varying as a function of a temperature of the resistive element;

comparing the voltage to a predetermined value to determine a variation of the voltage from the predetermined value; and

altering a power applied to the resistive element based on the variation, the temperature of the resistive element varying as a function of the altered applied power.

2. A method according to claim 1, wherein the resistive element is selected from the group consisting of a read transducer, a write transducer, a heating element, and a temperature sensing material.

3. A method according to claim 1, wherein the resistive element comprises material selected from the group consisting of magneto-resistive (MR) material, giant magneto-resistive (GMR) material, tunneling magneto-resistive (TuMR) material, current perpendicular to plane (CPP) material, and temperature sensing material.

4. A method according to claim 1, wherein detecting a voltage further comprises detecting a voltage across the resistive element using an output of a lowpass filter coupled to the resistive element.

5. A method according to claim 1, wherein detecting a voltage further comprises detecting a voltage across the resistive element when there is no power applied to the resistive element.

6. A method according to claim 1, wherein altering a power applied to the resistive element comprises altering a voltage applied to the resistive element.

7. A method according to claim 1, wherein altering a power applied to the resistive element comprises altering a current applied to the resistive element.

8. A method of sensing and controlling a temperature of a first resistive element configured for use in a read/write head of a magnetic data storage device, the method comprising:

detecting a voltage across a second resistive element thermally proximate to the first resistive element, the voltage varying as a function of a temperature of the second resistive element;

comparing the voltage to a predetermined value to determine a variation of the voltage from the predetermined value;

altering a power applied to the second resistive element based on the variation, the temperature of the second resistive element varying as a function of the altered applied power; and

affecting the temperature of the first resistive element with the temperature of the second resistive element due to the thermal proximity.

9. A method according to claim 8, wherein the first resistive element is selected from the group consisting of a read transducer, a write transducer, a heating element, and a temperature sensing material.

10. A method according to claim 8, wherein the second resistive element is selected from the group consisting of a read transducer, a write transducer, a heating element, and a temperature sensing material.

11. A method according to claim 8, wherein the first or second resistive elements comprise material selected from the group consisting of magneto-resistive (MR) material, giant magneto-resistive (GMR) material, tunneling magneto-resistive (TuMR) material, current perpendicular to plane (CPP) material, and temperature sensing material.

12. A method according to claim 8, wherein detecting a voltage further comprises detecting a voltage across the second resistive element using an output of a lowpass filter coupled to the second resistive element.

13. A method according to claim 8, wherein detecting a voltage further comprises detecting a voltage across the second resistive element when there is no power applied to the resistive element.

14. A method according to claim 8, wherein altering a power applied to the second resistive element comprises altering a voltage applied to the second resistive element.

15. A method according to claim 8, wherein altering a power applied to the second resistive element comprises altering a current applied to the second resistive element.

16. A system for sensing and controlling a temperature of a resistive element configured for use in a read/write head of a magnetic data storage device, the system comprising:

a resistive element having a voltage thereacross, the voltage varying as a function of a temperature of the resistive element;

comparison circuitry configured to compare the voltage across the resistive element with a predetermined value, and to generate an error signal based on the comparison; and

a control compensation module configured to receive the error signal and to alter a power applied to the resistive element based thereon, the temperature of the resistive element varying as a function of the altered applied power.

17. A system according to claim 16, wherein the resistive element is selected from the group consisting of a read transducer, a write transducer, a heating element, and a temperature sensing material.

18. A system according to claim 16, wherein the resistive element comprises material selected from the group consisting of magneto-resistive (MR) material, giant magneto-resistive (GMR) material, tunneling magneto-resistive (TuMR) material, current perpendicular to plane (CPP) material, and temperature sensing material.

19. A system according to claim 16, further comprising a lowpass filter coupled across the resistive element for detecting the voltage across thereacross by isolating low frequency signals received from the resistive element.

20. A system according to claim 16, wherein the control compensation module is further configured to alter a voltage applied to the resistive element.

21. A system according to claim 16, wherein the control compensation module is further configured to alter a current applied to the resistive element.

22. A system according to claim 16, wherein the control compensation module comprises a control compensation software module.

23. A system according to claim 16, wherein the control compensation module comprises control compensation circuitry.

24. A system according to claim 16, wherein the resistive element is a first resistive element, the system further comprising:

a second resistive element located thermally proximate the first resistive element and having a voltage thereacross, the voltage varying as a function of a temperature of the second resistive element, and

wherein the comparison circuitry is configured to compare the voltage across the second resistive element with a predetermined value, and to generate an error signal based on the comparison, and

wherein the control compensation module is configured to alter a power applied to the second resistive element based on the comparison, the temperature of the second resistive element varying as a function of the altered applied power and the temperature of the first resistive element varying with the temperature of the second resistive element due to the thermal proximity.